

U.S. Patent Application Serial No. 10/517,765
Reply to OA dated July 24, 2009

REMARKS

The claims have been amended to clarify the present invention. Claims 9, 24 and 27 are independent claims, with other claims dependent directly or indirectly therefrom. No new matter is involved. Claims 1-8 and 10-18 are cancelled without prejudice or disclaimer. It is believed that this amendment is fully responsive to the Office Action mailed on July 24, 2009.

Independent Claim 9, as now amended, is to a substrate treating apparatus that has a processing chamber for processing substrates, and a substrate support member for supporting the substrates in the processing chamber, where the substrate support member has multiple holding members installed vertically, each of the holding members has multiple support grooves, and each of the support grooves containing a support section to contact the substrate. A receiving section is formed, in a flat plate with a rectangular shape as seen from a plan view, and provided below the support section and extends outwards from a section of the outer periphery of the support section, and the receiving section extends outwards to 6 mm or more from a section of the outer periphery of the support section. Independent Claim 24, as now amended, is to a substrate treating apparatus that has a processing chamber for processing substrates, and a substrate support member for supporting the substrates in the processing chamber, where the substrate support member has multiple holding members installed vertically, and each of the holding members has multiple support grooves, each of the support grooves containing a support section to contact the substrate. A receiving section, formed in a flat plate with a rectangular shape as seen from a plan view, is provided below the support section and extends outwards from a section of the outer periphery of

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the support section, the support section formed in a flat plate with a flat trapezoidal shape as seen from a plan view, and the width of the support section becomes narrower as it approaches the center of the substrate. Independent Claim 27, as now amended, is to a substrate treating apparatus that has a processing chamber for processing substrates, and a substrate support member for supporting the substrates in the processing chamber, where the substrate support member has multiple holding members installed vertically, and each of the holding members has multiple support grooves. Each of the support grooves contains a support section to contact the substrate, and a receiving section, formed as a flat plate, below the support section and extending outwards from a section of the outer periphery of the support section, the support section being formed in a flat plate with a trapezoidal shape as seen from a plan view, and the width of the support section becomes narrower as it approaches the center of the substrate.

In the Office Action, the use of the term "mountain" was objected to in Claim 24. The claim has been amended to use "flat trapezoidal shape in plan view", and removal of the objection is respectfully requested. Support is found at page 27, line 17 of the present specification.

In the Office Action, Claims 9 and 19-29 are rejected as obvious under 35 U.S.C. 103(a) in view of newly applied Okada (JP 2000-166349). Reconsideration and removal of this rejection are respectfully requested in view of the present claim amendments and the following remarks.

The Office Action asserts that Okada shows a substrate support member (2) for supporting substrates in a processing chamber, where the substrate support member has multiple holding members installed vertically, each of the holding members having multiple support grooves and each

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of the support grooves contains a support section (211) to contact the substrate, and a receiving section (210) formed below the support section and extending outwards from a section of the outer periphery of the support section.

While Okada does not teach a processing chamber, the Office Action alleges it would be obvious to use the Okada support member in a heat treatment chamber.

Applicants would point out that in Okada, a wafer support part (2) is provided that has a support face (210) which has a curved upper surface. There can be a polished portion (211) on the upper support face (210). While the Office Action alleges that the surface (210) is a recovering section, that surface is curved and would not hold particles such as would be held by a flat receiving surface. Claims 9 and 24 have been amended to specify that the receiving section is formed "in a flat plate with a rectangular shape as seen from a plan view", and Claim 27 has been amended to specify that the receiving section is formed "as a flat plate". This is distinct from and advantageous over any Okada structure.

In Claim 9, as amended, the extension of the receiving section extends 6 mm or more, so the particle increase can be reduced to approximately 20 or fewer particles (practical usage level). The increase in particles will exceed 20 particles if the receiving section extension quantity is less than 6 mm. If the receiving section extension extends, for example 2 mm, then the particle increase will be 45 particles (at least double the number of particles than at 6 mm extension); if the receiving section extension extends 0 mm, then the particle increase will be 133 particles (6 times or more the number of particles than at 6 mm extension).

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The present inventors found that setting the receiving section extension to extend 6 mm or more can drastically decrease the number of particles and attain a practical usage level.

At the receiving section extension of 15 mm, the particle reduction effect is saturated. In other words, there is no further change in the particle reduction effect even if the extension is extended further. Setting the receiving section extension quantity between 6 mm and 15 mm in Claim 19, allows for drastic reduction in particle increase and also avoids the need to enlarge the receiving section or, in other words, the substrate support member.

By setting the receiving section extension to extend 10 mm or more, the invention of Claim 20 can reduce the particle increase to approximately 10 particles or less ($\frac{1}{2}$ or less than the number of particles than at 6 mm extension).

By setting the receiving section extension to extend between 10 mm and 15 mm, the invention of Claim 21 can reduce the particle increase to approximately 10 particles or less, and also avoid the need to enlarge the receiving section or, in other words, the substrate support member.

The invention of Claim 9 is therefore not merely a selection of the optimum range of the extension of the receiving section, but is based on a discovery of the critical point capable of reducing an increased amount of particles to the practical usage level. Claim 9 generates new and unexpected results that could not be obtained by the prior art.

In Claims 24 and 27, the number of machining steps can be reduced since the receiving section and the support section can be formed simultaneously just by cur-machining the support groove on the holding member. The number of parts can also be reduced by integrating the support

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section, the receiving section and the holding member into one piece, and therefore the cost of substrate treating apparatus can be lowered as well as the substrate support member.

The cut-machining of the holding member is simple since the support section is a plate shaped trapezoid as seen from a plan view and formed so that the width narrows towards the center of the substrate. Further, the mechanical strength of the holding member is maintained and the contact surface area with the substrate can therefore be reduced. In other words, not only is the substrate support member easy to machine, but the substrate support member is also maintained at an ample structural strength while supporting the weight of the substrate, and at the same time the extent of contamination due to contact with the rear surface of the substrate can be lowered by reducing the size of the contact surface area with the substrate.

On the contrary, Okuda merely discloses a configuration in which the central part of the support face (210) is formed by a convex spherical curved surface. Okuda does not teach or suggest any configuration of the present claimed invention. The aforementioned action and effects of the present invention cannot be attained with the configuration of Okuda.

In view of the aforementioned amendments and accompanying remarks, Claims 9 and 19-29, as amended, are believed to be patentable and in condition for allowance, which action, at an early date, is requested.

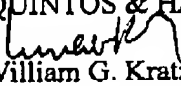
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the Applicants undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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In the event that this paper is not timely filed, the Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosure: Petition for Extension of Time